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L Number	Hits	Search Text	DB	Time stamp
-	171	(resourc\$3 adj5 conflict\$3) and (client or server)	USPAT	2003/07/29 13:39
-	8	(resourc\$3 adj5 conflict\$3) and (client or server) and (detect\$3) and (determin\$3) and (evaluat\$3) and (version) and (tag)	USPAT	2002/10/10 14:14
-	35	(resourc\$3 adj5 conflict\$3) and (client or server) and (detect\$3) and (determin\$3) and (evaluat\$3)	USPAT	2002/10/10 14:17
-	310	(resourc\$3 adj5 conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3)	USPAT	2002/10/10 16:38
-	34	((resourc\$3 adj5 conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3)) and 709/\$.ccls.	USPAT	2002/10/10 14:17
-	0	(resourc\$3 adj5 conflict\$3) and (dhcp)	USPAT	2002/10/10 14:26
-	337	dhcp	USPAT	2002/10/10 14:26
-	49	dhcp and conflict\$3	USPAT	2002/10/10 14:34
-	11	dhcp and (resolv\$3 adj5 conflict\$3)	USPAT	2002/10/15 14:04
-	337	dhcp	USPAT	2002/10/10 14:36
-	184	dhcp and 709/\$.ccls.	USPAT	2002/10/10 14:36
-	123	(dhcp and 709/\$.ccls.) and resourc\$3	USPAT	2002/10/10 14:36
-	23	(dhcp and 709/\$.ccls.) and conflict\$3	USPAT	2002/10/10 14:37
-	104	(dhcp and 709/\$.ccls.) and allocat\$3	USPAT	2002/10/10 14:37
-	37	((dhcp and 709/\$.ccls.) and allocat\$3) and detect\$3 and determin\$3 and version	USPAT	2002/10/10 14:43
-	299	server and client and (resolv\$3 adj10 conflict\$3)	USPAT	2003/07/28 10:58
-	123	server and client and (resolv\$3 adj10 conflict\$3) and resourc\$3 and detect\$3 and determin\$3 and version	USPAT	2002/10/10 14:44
-	9	server and client and (resolv\$3 adj10 conflict\$3) and resourc\$3 and detect\$3 and determin\$3 and version and dhcp	USPAT	2002/10/10 14:52
-	123	server and client and (resolv\$3 adj10 conflict\$3) and resourc\$3 and detect\$3 and determin\$3 and version	USPAT	2002/10/10 14:53
-	34	server and client and (resolv\$3 adj10 conflict\$3) and resourc\$3 and detect\$3 and determin\$3 and version and tag	USPAT	2002/10/10 14:55
-	11	dhcp and assign\$5 and (resolv\$3 adj5 conflict\$3)	USPAT	2002/10/10 14:56
-	47	dhcp and assign\$5 and conflict\$3	USPAT	2002/10/10 14:58
-	136	bootp	USPAT	2002/10/10 14:59
-	16	bootp and conflict\$3	USPAT	2002/10/10 14:59
-	287	dhcp and assign\$5	USPAT	2002/10/10 15:33
-	1	"5586269".PN.	USPAT	2002/10/10 15:09
-	1	"5557748".PN.	USPAT	2002/10/10 15:09
-	1	"5530896".PN.	USPAT	2002/10/10 15:10
-	1	"5459713".PN.	USPAT	2002/10/10 15:10
-	1	"4825204".PN.	USPAT	2002/10/10 15:10
-	1	"5150464".PN.	USPAT	2002/10/10 15:11

-	1	"5159592".PN.	USPAT	2002/10/10 15:14
-	1	"5159592".PN.	USPAT	2002/10/10 15:14
-	1	"5229988".PN.	USPAT	2002/10/10 15:14
-	1	"5283571".PN.	USPAT	2002/10/10 15:15
-	1	"5327534".PN.	USPAT	2002/10/10 15:16
-	1	"5327534".PN.	USPAT	2002/10/10 15:17
-	1	"5446897".PN.	USPAT	2002/10/10 15:17
-	1	"4941089".PN.	USPAT	2002/10/10 15:18
-	1	"4835674".PN.	USPAT	2002/10/10 15:18
-	1	"4660141".PN.	USPAT	2002/10/10 15:18
-	1	"4466060".PN.	USPAT	2002/10/10 15:19
-	1	"5598536".PN.	USPAT	2002/10/10 15:28
-	1	"5553239".PN.	USPAT	2002/10/10 15:28
-	1	"5410691".PN.	USPAT	2002/10/10 15:29
-	1	"5410543".PN.	USPAT	2002/10/10 15:29
-	1	"5276680".PN.	USPAT	2002/10/10 15:30
-	1	"4989204".PN.	USPAT	2002/10/10 15:30
-	1	"5159592".PN.	USPAT	2002/10/10 15:31
-	1	"5181200".PN.	USPAT	2002/10/10 15:31
-	1269	address\$3 adj10 conflict\$3	USPAT	2002/10/10 15:34
-	121	(address\$3 adj10 conflict\$3) and 709/\$.ccls.	USPAT	2002/10/10 15:34
-	40	(address\$3 adj10 conflict\$3) and static and 709/\$.ccls.	USPAT	2002/10/10 15:35
-	93	(address\$3 adj10 conflict\$3) and network and 709/\$.ccls.	USPAT	2002/10/10 15:35
-	28	(address\$3 adj10 conflict\$3) and network and client and server and 709/\$.ccls.	USPAT	2002/10/10 15:43
-	1	"5079767".PN.	USPAT	2002/10/10 15:41
-	1	"5276442".PN.	USPAT	2002/10/10 15:41
-	13	(address\$3 adj10 conflict\$3) and resolv\$3 and client and server and 709/\$.ccls.	USPAT	2002/10/10 15:45
-	9	((network adj address\$3) same conflict\$3) and resolv\$3 and client and server and 709/\$.ccls.	USPAT	2002/10/10 15:47
-	10	((network adj address\$3) same conflict\$3) and resolv\$3 and client and server	USPAT	2002/10/10 15:50
-	19	((network adj address\$3) same conflict\$3) and resolv\$3	USPAT	2002/10/10 16:38
-	1	"5490252".PN.	USPAT	2002/10/10 15:53
-	1	"5329619".PN.	USPAT	2002/10/10 15:53
-	1	"5313579".PN.	USPAT	2002/10/10 15:53
-	1	"5313465".PN.	USPAT	2002/10/10 15:54
-	1	"4584639".PN.	USPAT	2002/10/10 15:57

-	1	"4916704".PN.	USPAT	2002/10/10 15:57
-	1	"4924513".PN.	USPAT	2002/10/10 15:57
-	1	"5200993".PN.	USPAT	2002/10/10 15:57
-	1	"5251205".PN.	USPAT	2002/10/10 15:57
-	1	"5260999".PN.	USPAT	2002/10/10 15:58
-	11	(resourc\$3 adj5 conflict) and (network adj3 address\$3)	USPAT	2002/10/10 16:10
-	74	(resourc\$3 adj5 conflict) and client and server	USPAT	2002/10/10 16:29
-	77	(resourc\$3 adj5 conflict) and (resolv\$3) and (client or server)	USPAT	2002/10/10 16:30
-	12	(resourc\$3 adj5 conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3) and 707/\$.ccls.	USPAT	2002/10/11 12:57
-	1	("5317562").PN.	USPAT	2002/10/11 11:00
-	1	("5367643").PN.	USPAT	2002/10/11 11:00
-	8	(ip adj5 conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3)	USPAT	2002/10/11 13:01
-	8	((internet adj address) or ip) adj5 conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3)	USPAT	2002/10/11 13:03
-	13	((internet adj address) or ip) adj5 conflict\$3) and (detect\$3) and (determin\$3)	USPAT	2002/10/11 13:04
-	0	(solv\$3 same ((internet adj address) or ip) adj5 conflict\$3)	USPAT	2002/10/11 13:05
-	0	(solv\$3 same (ip adj5 conflict\$3))	USPAT	2002/10/11 13:05
-	0	(solv\$3 same (ip with conflict\$3))	USPAT	2002/10/11 13:05
-	0	(solv\$3 same ((internet adj address) with conflict\$3))	USPAT	2002/10/11 13:06
-	16	(solv\$3 adj10 conflict\$3) and (ip or internet adj address))	USPAT	2002/10/11 13:21
-	12	(resourc\$3 adj10 conflict\$3) and (resourc\$3 adj5 tag) and (resolv\$3)	USPAT	2002/10/11 13:23
-	0	(resourc\$3 adj10 conflict\$3) and (server) and (tag) and (schema)	USPAT	2002/10/11 13:24
-	37	(resourc\$3 adj10 conflict\$3) and (server) and (tag)	USPAT	2002/10/11 13:25
-	181	(resourc\$3 adj10 conflict\$3) and (server)	USPAT	2002/10/11 13:25
-	99	(resourc\$3 adj10 conflict\$3) and (server) and (resolv\$3)	USPAT	2002/10/11 14:12
-	3086	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3)	USPAT	2002/10/11 14:14
-	584	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server)	USPAT	2002/10/11 14:14
-	137	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag) and (compar\$3)	USPAT	2002/10/11 14:15
-	382	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag or version) and (compar\$3)	USPAT	2002/10/11 14:16
-	9	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag or version) and (compar\$3) and (cop\$3 adj5 resourc\$3)	USPAT	2002/10/11 14:52

-	382	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag or version) and (compar\$3)	USPAT	2002/10/11 14:53
-	118	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag or version) and (compar\$3) and 709/\$.ccls.	USPAT	2002/10/11 14:54
-	105	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag or version) and (compar\$3) and (cop\$3) and 709/\$.ccls.	USPAT	2002/10/11 15:26
-	1	"5491457".PN.	USPAT	2002/10/11 15:21
-	1	"5444765".PN.	USPAT	2002/10/11 15:21
-	1	"5442633".PN.	USPAT	2002/10/11 15:22
-	1	"5432814".PN.	USPAT	2002/10/11 15:22
-	1	"5430790".PN.	USPAT	2002/10/11 15:22
-	1	"5400338".PN.	USPAT	2002/10/11 15:23
-	1	"5164985".PN.	USPAT	2002/10/11 15:23
-	1	"5185700".PN.	USPAT	2002/10/11 15:23
-	1	"5287384".PN.	USPAT	2002/10/11 15:23
-	1	"5241542".PN.	USPAT	2002/10/11 15:23
-	1	"Re34034".PN.	USPAT	2002/10/11 15:23
-	1	"4456793".PN.	USPAT	2002/10/11 15:24
-	1	"4991197".PN.	USPAT	2002/10/11 15:24
-	1	"5130987".PN.	USPAT	2002/10/11 15:24
-	1	"5130987".PN.	USPAT	2002/10/11 15:25
-	1	"5123029".PN.	USPAT	2002/10/11 15:25
-	29	(resourc\$3) and (conflict\$3) and (detect\$3) and (determin\$3) and (resolv\$3 or solv\$3) and (client) and (server) and (tag or version) and (compar\$3) and (cop\$3) and (wireless) and 709/\$.ccls.	USPAT	2002/10/11 15:31
-	57	(wireless or wireless) and (network adj5 initiat\$3) and conflict	USPAT	2002/10/11 15:40
-	21	(wireless or wireless) and (address adj5 initiat\$3) and conflict	USPAT	2002/10/15 13:48
-	1	"5237614".PN.	USPAT	2002/10/11 15:50
-	1	"5241594".PN.	USPAT	2002/10/11 15:51
-	1	"5572643".PN.	USPAT	2002/10/11 15:51
-	1	"5611049".PN.	USPAT	2002/10/11 15:52
-	1	"5682478".PN.	USPAT	2002/10/11 15:52
-	1	"5696898".PN.	USPAT	2002/10/11 15:53
-	1	"5706507".PN.	USPAT	2002/10/11 15:54
-	32	(wireless or wireless) and (resourc\$3 with conflict) and (resolv\$3)	USPAT	2002/10/11 16:00

-	27	(static with IP) and conflict\$3	USPAT	2002/10/11 16:07
-	15	(static with IP) and conflict\$3 and resolv\$3	USPAT	2002/10/11 16:08
-	28	(IP with conflict\$3) and resolv\$3	USPAT	2002/10/11 16:29
-	1	"5812819".PN.	USPAT	2002/10/11 16:16
-	1	"5854901".PN.	USPAT	2002/10/11 16:17
-	1	"5884038".PN.	USPAT	2002/10/11 16:17
-	1	"6058431".PN.	USPAT	2002/10/11 16:26
-	1	"6108330".PN.	USPAT	2002/10/11 16:26
-	1	"6128664".PN.	USPAT	2002/10/11 16:26
-	1	"6266707".PN.	USPAT	2002/10/11 16:27
-	1	"6269099".PN.	USPAT	2002/10/11 16:27
-	1	"6304908".PN.	USPAT	2002/10/11 16:27
-	1	"6327662".PN.	USPAT	2002/10/11 16:28
-	15	((IP adj address) with conflict\$3) and resolv\$3	USPAT	2002/10/11 16:30
-	10	((IP adj address) near conflict\$3) and resolv\$3	USPAT	2002/10/11 16:31
-	1	(resolv\$3 with ((ip adj address) adj10 conflict\$3))	USPAT	2002/10/11 16:33
-	1	(resolv\$3 same ((ip adj address) adj10 conflict\$3))	USPAT	2002/10/11 16:33
-	1	((solv\$3 or resolv\$3) same ((ip adj address) adj10 conflict\$3))	USPAT	2002/10/11 16:34
-	1	((solv\$3 or resolv\$3) same ((ip adj address) adj10 conflict\$3)) and version	USPAT	2002/10/11 16:34
-	1	((solv\$3 or resolv\$3) same (((internet adj protocol) or ip) adj address) adj10 conflict\$3))	USPAT	2002/10/11 16:35
-	4	((solv\$3 or resolv\$3) same (((internet adj protocol) or ip) with address) with conflict\$3))	USPAT	2002/10/11 16:37
-	0	(static with (((internet adj protocol) or ip) adj3 address) with conflict\$3))	USPAT	2002/10/11 16:38
-	9	(static with ((internet adj protocol) or ip) adj3 address) and (conflict\$3) and (initializat\$3)	USPAT	2002/10/11 16:39
-	34	(US-6157935-\$ or US-6183366-\$ or US-5748980-\$ or US-5823879-\$ or US-6167445-\$ or US-5953707-\$ or US-5980096-\$ or US-5982891-\$ or US-5987506-\$ or US-6003097-\$ or US-5675802-\$ or US-6185683-\$ or US-6202060-\$ or US-6263335-\$ or US-6264560-\$ or US-6289382-\$ or US-6442748-\$ or US-6434568-\$ or US-6434628-\$ or US-6438594-\$ or US-6339832-\$ or US-6343339-\$ or US-6396509-\$ or US-6400996-\$ or US-6418424-\$ or US-5701400-\$).did. or (US-5680619-\$ or US-5655148-\$ or US-4853843-\$ or US-6076088-\$ or US-6144961-\$ or US-6151582-\$ or US-6332163-\$ or US-6336152-\$).did.	USPAT	2002/10/15 11:35

-	11	((US-6157935-\$ or US-6183366-\$ or US-5748980-\$ or US-5823879-\$ or US-6167445-\$ or US-5953707-\$ or US-5980096-\$ or US-5982891-\$ or US-5987506-\$ or US-6003097-\$ or US-5675802-\$ or US-6185683-\$ or US-6202060-\$ or US-6263335-\$ or US-6264560-\$ or US-6289382-\$ or US-6442748-\$ or US-6434568-\$ or US-6434628-\$ or US-6438594-\$ or US-6339832-\$ or US-6343339-\$ or US-6396509-\$ or US-6400996-\$ or US-6418424-\$ or US-5701400-\$).did. or (US-5680619-\$ or US-5655148-\$ or US-4853843-\$ or US-6076088-\$ or US-6144961-\$ or US-6151582-\$ or US-6332163-\$ or US-6336152-\$).did.) and batch\$3	USPAT	2002/10/15 11:35
-	11	((US-6157935-\$ or US-6183366-\$ or US-5748980-\$ or US-5823879-\$ or US-6167445-\$ or US-5953707-\$ or US-5980096-\$ or US-5982891-\$ or US-5987506-\$ or US-6003097-\$ or US-5675802-\$ or US-6185683-\$ or US-6202060-\$ or US-6263335-\$ or US-6264560-\$ or US-6289382-\$ or US-6442748-\$ or US-6434568-\$ or US-6434628-\$ or US-6438594-\$ or US-6339832-\$ or US-6343339-\$ or US-6396509-\$ or US-6400996-\$ or US-6418424-\$ or US-5701400-\$).did. or (US-5680619-\$ or US-5655148-\$ or US-4853843-\$ or US-6076088-\$ or US-6144961-\$ or US-6151582-\$ or US-6332163-\$ or US-6336152-\$).did.) and batch\$3)	USPAT	2002/10/15 11:36
-	0	((US-6157935-\$ or US-6183366-\$ or US-5748980-\$ or US-5823879-\$ or US-6167445-\$ or US-5953707-\$ or US-5980096-\$ or US-5982891-\$ or US-5987506-\$ or US-6003097-\$ or US-5675802-\$ or US-6185683-\$ or US-6202060-\$ or US-6263335-\$ or US-6264560-\$ or US-6289382-\$ or US-6442748-\$ or US-6434568-\$ or US-6434628-\$ or US-6438594-\$ or US-6339832-\$ or US-6343339-\$ or US-6396509-\$ or US-6400996-\$ or US-6418424-\$ or US-5701400-\$).did. or (US-5680619-\$ or US-5655148-\$ or US-4853843-\$ or US-6076088-\$ or US-6144961-\$ or US-6151582-\$ or US-6332163-\$ or US-6336152-\$).did.) and batch\$3) and conflict\$3	USPAT	2002/10/15 11:36
-	1	("4435753").PN.	USPAT	2002/10/15 13:48
-	69	((internet adj protocol) and (resolv\$3 adj5 conflict\$3))	USPAT	2002/10/15 14:14
-	0	((ip adj conflict) and (resolv\$3 adj5 conflict\$3))	USPAT	2002/10/15 14:14
-	2	((ip adj5 conflict) and (resolv\$3 adj5 conflict\$3))	USPAT	2002/10/15 14:16
-	8	((ip adj5 configurat\$3) and (resolv\$3 adj5 conflict\$3))	USPAT	2002/10/15 14:19
-	73	((resourc\$3 adj5 conflict\$3) and (method with resolv\$3))	USPAT	2002/10/15 14:20
-	10	((resourc\$3 adj5 conflict\$3) and (method with resolv\$3)) and 709/\$.ccls.	USPAT	2002/10/15 14:23
-	4	((resourc\$3 adj5 conflict\$3) and (method with resolv\$3)) and 707/\$.ccls.	USPAT	2002/10/15 14:25
-	2	(ip adj5 assign\$5) and (conflict\$3) and (resourc\$3 with resolv\$3)	USPAT	2002/10/15 14:39

-	1	"6154776".PN.	USPAT	2002/10/15 14:30
-	1	"6141687".PN.	USPAT	2002/10/15 14:30
-	1	"6119160".PN.	USPAT	2002/10/15 14:31
-	1	"6092196".PN.	USPAT	2002/10/15 14:31
-	1	"6092178".PN.	USPAT	2002/10/15 14:32
-	1	"6055236".PN.	USPAT	2002/10/15 14:32
-	1	"6091951".PN.	USPAT	2002/10/15 14:32
-	1	"5835720".PN.	USPAT	2002/10/15 14:33
-	1	"5968116".PN.	USPAT	2002/10/15 14:33
-	1	"5430715".PN.	USPAT	2002/10/15 14:33
-	1	"5991828".PN.	USPAT	2002/10/15 14:34
-	1	"5430715".PN.	USPAT	2002/10/15 14:34
-	1	"5655077".PN.	USPAT	2002/10/15 14:34
-	1	"5944824".PN.	USPAT	2002/10/15 14:34
-	1	"5926458".PN.	USPAT	2002/10/15 14:34
-	1	"5793763".PN.	USPAT	2002/10/15 14:35
-	1	"5684950".PN.	USPAT	2002/10/15 14:35
-	1	"5734654".PN.	USPAT	2002/10/15 14:35
-	1	"5970477".PN.	USPAT	2002/10/15 14:36
-	1	"6009103".PN.	USPAT	2002/10/15 14:36
-	1	"5845070".PN.	USPAT	2002/10/15 14:38
-	1	"6009103".PN.	USPAT	2002/10/15 14:38
-	0	(static adj (ip adj5 assign\$5)) and (conflict\$3)	USPAT	2002/10/15 14:40
-	1	(static with (ip adj5 assign\$5)) and (conflict\$3)	USPAT	2002/10/15 14:41
-	41	(static with (ip adj5 assign\$5))	USPAT	2002/10/15 14:45
-	0	((resolv\$3 or solv\$3) near (ip adj conflict\$3))	USPAT	2002/10/15 17:21
-	0	((resolv\$3 or solv\$3) with (ip adj conflict\$3))	USPAT	2002/10/15 14:46
-	2	((resolv\$3 or solv\$3) with (ip adj5 conflict\$3))	USPAT	2002/10/15 15:16
-	4	((("5586269") or ("5557748") or ("5530896") or ("5526489")).PN.	USPAT	2002/10/15 15:18
-	9	((("5459713") or ("5446897") or ("5327534") or ("5283571") or ("5229988") or ("5159592") or ("5150464") or ("4825204") or ("4689786")).PN.	USPAT	2002/10/15 15:19
-	1	"4941089".PN.	USPAT	2002/10/15 15:25
-	1	"4835674".PN.	USPAT	2002/10/15 15:25
-	1	"4466060".PN.	USPAT	2002/10/15 15:25
-	4	((("4466060") or ("4660141") or ("4835674") or ("4941089")).PN.	USPAT	2002/10/15 16:29
-	0	((resolv\$3 or solv\$3) near (ip adj duplicat\$3))	USPAT	2002/10/15 17:22

-	0	((resolv\$3 or solv\$3) near (ip near5 duplicat\$3))	USPAT	2002/10/15 17:23
-	36	(ip near5 duplicat\$5) and (detect\$3) and (correct\$3)	USPAT	2002/10/17 12:57
-	8	("5875306") or ("5872523") or ("5862345") or ("5854901") or ("5835723") or ("5812819") or ("5812552") or ("5790548")).PN.	USPAT	2002/10/17 10:08
-	1	("5150464").PN.	USPAT	2002/10/17 11:14
-	1	("6101499").PN.	USPAT	2002/10/17 11:14
-	18	(ip near5 duplicat\$5) and (detect\$3) and (correct\$3) and put	USPAT	2002/10/17 12:58
-	0	(ip near5 duplicat\$5) and (detect\$3) and (correct\$3) and (put adj5 method)	USPAT	2002/10/17 13:13
-	100	(resourc\$3 adj5 allocat\$3) and (schema)	USPAT	2002/10/17 13:13
-	39	(resourc\$3 adj5 allocat\$3) and (schema) and (conflict\$3)	USPAT	2002/10/17 14:55
-	110	(resourc\$3 adj5 allocat\$3) and (detect\$3) and (determin\$3) and (compar\$3) and (resolv\$3 or solv\$3) and (conflict\$3) and (client) and (server)	USPAT	2002/10/17 14:56
-	101	(resourc\$3 adj5 allocat\$3) and (detect\$3) and (determin\$3) and (compar\$3) and (resolv\$3 or solv\$3) and (conflict\$3) and (client) and (server) and (tag\$3 or version)	USPAT	2002/10/17 15:03
-	25	(resourc\$3 adj5 allocat\$3) and (detect\$3) and (determin\$3) and (compar\$3) and (resolv\$3 or solv\$3) and (conflict\$3) and (client) and (server) and (tag\$3) and (version)	USPAT	2002/10/17 15:10
-	25	(resourc\$3 adj5 allocat\$3) and (detect\$3) and (determin\$3) and (compar\$3) and (resolv\$3 or solv\$3 or resolut\$3) and (conflict\$3) and (client) and (server) and (tag\$3) and (version)	USPAT	2002/10/17 15:11
-	6	((detect\$3 or resolv\$3 or solv\$3 or resolut\$3) same (resourc\$3 adj10 conflict\$3)) and (client) and (server) and (tag\$3) and (version)	USPAT	2002/10/17 15:12
-	7	((detect\$3 or resolv\$3 or solv\$3 or resolut\$3) same (resourc\$3 adj10 conflict\$3)) and (client) and (server) and (tag\$3)	USPAT	2002/10/17 15:14
-	240	(resourc\$3 adj10 conflict\$3) and tag	USPAT	2002/10/17 15:14
-	14	(resourc\$3 adj10 conflict\$3) and tag and client and server	USPAT	2002/10/17 15:18
-	4	(version adj10 conflict) and (resourc\$3 with allocat\$3)	USPAT	2002/10/17 15:20
-	9	(version with conflict) and (resourc\$3 adj5 allocat\$3) and (client or server)	USPAT	2002/10/17 15:35
-	158	(conflict adj10 resolution) and client and server	USPAT	2002/10/17 15:36
-	107	(conflict adj10 resolution) and client and server and resourc\$3	USPAT	2002/10/17 15:36
-	18	(conflict adj10 resolution) and client and server and (resourc\$3 adj5 allocat\$3)	USPAT	2002/10/17 15:49
-	48	(conflict with resolution) and client and server and (resourc\$3 with allocat\$3)	USPAT	2002/10/17 16:09
-	7	("5628005") or ("5555404") or ("5237680") or ("5218695") or ("5175851") or ("5113519") or ("4941059")).PN.	USPAT	2002/10/17 16:07
-	11	(version near5 conflict\$3) and client and server and (resourc\$3 with allocat\$3)	USPAT	2002/10/17 16:13
-	28	(version same conflict\$3) and client and server and (resourc\$3 same allocat\$3)	USPAT	2002/10/18 09:47
-	1	"5265235".PN.	USPAT	2002/10/17 16:25

-	1	"5151989".PN.	USPAT	2002/10/17 16:25
-	1	"4897781".PN.	USPAT	2002/10/17 16:28
-	1	"4594656".PN.	USPAT	2002/10/17 16:29
-	1	"4714996".PN.	USPAT	2002/10/17 16:30
-	1	"4887204".PN.	USPAT	2002/10/17 16:34
-	1	"4897781".PN.	USPAT	2002/10/17 16:34
-	1	"5113519".PN.	USPAT	2002/10/17 16:34
-	1	(version same conflict\$3) and client and server and (resourc\$3 same allocat\$3) and tag	USPAT	2002/10/18 09:51
-	29	((tag\$4 or version) same conflict\$3) and client and server and (resourc\$3 same allocat\$3)	USPAT	2002/10/18 10:01
-	87	((tag\$4 or version) same compar\$3) and client and server and (resourc\$3 same allocat\$3)	USPAT	2002/10/18 10:01
-	37	((tag\$4 or version) same compar\$3) and client and server and (resourc\$3 same allocat\$3) and conflict\$3	USPAT	2002/10/18 11:56
-	1	("5832512").PN.	USPAT	2002/10/18 10:31
-	1	("5493728").PN.	USPAT	2002/10/18 10:42
-	1	("6324581").PN.	USPAT	2002/10/18 10:42
-	1	("4714996").PN.	USPAT	2002/10/18 11:40
-	74	((tag\$4 or version) same compar\$3) and server and (resourc\$3 same allocat\$3) and conflict\$3	USPAT	2002/10/18 12:00
-	33	((tag\$4 or version) same conflict\$3) and server and (resourc\$3 same allocat\$3) and compar\$3	USPAT	2002/10/18 12:01
-	113	(detect\$3 same conflict\$3) and (resourc\$3 same cop\$4)	USPAT	2002/10/18 12:02
-	20	(detect\$3 same conflict\$3) and (resourc\$3 same cop\$4) and ((tag or version) same compar\$3)	USPAT	2002/10/18 13:58
-	1	("6243736").PN.	USPAT	2002/10/21 11:48
-	2	((("4714996") or ("6324581"))).PN.	USPAT	2002/10/21 11:48
-	3	(resourc\$3 adj5 allocat\$3) and (put adj method)	USPAT	2002/10/21 14:03
-	4	(resourc\$3 same allocat\$3) and (put adj method)	USPAT	2002/10/21 14:26
-	1916	(multi\$computer or multi\$processor) and 709/\$.ccls.	USPAT	2002/10/21 14:27
-	0	(multi\$computer or multi\$processor) and (color\$display) and (chases) and 709/\$.ccls.	USPAT	2002/10/21 14:27
-	0	(multi\$computer or multi\$processor) and (color\$display) and 709/\$.ccls.	USPAT	2002/10/21 14:27
-	723	(multi\$computer or multi\$processor) and (display) and 709/\$.ccls.	USPAT	2002/10/21 14:28
-	121	(multi\$computer or multi\$processor) and (display) and (color\$3) and 709/\$.ccls.	USPAT	2002/10/21 14:32
-	51	(multi\$computer or multi\$processor) and (computer adj5 case) and 709/\$.ccls.	USPAT	2002/10/21 14:32
-	6	(multi\$computer or multi\$processor) and (computer adj5 case) and (color\$3) and 709/\$.ccls.	USPAT	2002/10/21 14:33
-	75	(multi\$computer or multi\$processor) and ((computer adj5 case) or chas\$2) and 709/\$.ccls.	USPAT	2002/10/21 16:17

-	4	((("5483588") or ("6430564") or ("4853843") or ("5832512")).PN.	USPAT	2002/10/21 16:17
-	113	client and server and (resource near3 conflict\$3)	USPAT	2003/07/28 13:05
-	49	(client and server and (resource near3 conflict\$3)) and 709/\$.ccls.	USPAT	2003/07/28 12:49
-	15	(resource same conflict\$3).ti.	USPAT	2003/07/28 11:03
-	26	(client and server and (resource near3 conflict\$3)) and 707/\$.ccls.	USPAT	2003/07/28 12:57
-	6	(client and server and (resource near3 conflict\$3)) and 717/\$.ccls.	USPAT	2003/07/28 13:03
-	7	(client and server and (resource near3 conflict\$3)) and 714/\$.ccls.	USPAT	2003/07/28 13:04
-	4	(client and server and (resource near3 conflict\$3)) and 712/\$.ccls.	USPAT	2003/07/28 13:04
-	13	(client and server and (resource near3 conflict\$3)) and 711/\$.ccls.	USPAT	2003/07/28 13:05
-	24	(client and server and (resource near3 conflict\$3)) and 710/\$.ccls.	USPAT	2003/07/28 13:05
-	303	(resolution) and (resource near3 conflict\$3)	USPAT	2003/07/28 13:12
-	1	"5649195".PN.	USPAT	2003/07/28 13:07
-	1	"5627961".PN.	USPAT	2003/07/28 13:08
-	1	"5613113".PN.	USPAT	2003/07/28 13:08
-	1	"5600834".PN.	USPAT	2003/07/28 13:08
-	1	"5600834".PN.	USPAT	2003/07/28 13:10
-	1	"5440730".PN.	USPAT	2003/07/28 13:10
-	1	"5261069".PN.	USPAT	2003/07/28 13:11
-	527	(resolution or resolv\$3) and (resource near3 conflict\$3)	USPAT	2003/07/28 13:12
-	221	(resolution or resolv\$3) same (resource near3 conflict\$3)	USPAT	2003/07/28 16:05
-	35	((resolution or resolv\$3) same (resource near3 conflict\$3)) and 709/\$.ccls.	USPAT	2003/07/28 13:50
-	1	"5581261".PN.	USPAT	2003/07/28 13:46
-	1	"5553281".PN.	USPAT	2003/07/28 13:47
-	1	"5542055".PN.	USPAT	2003/07/28 13:47
-	1	"5454078".PN.	USPAT	2003/07/28 13:48
-	17	((resolution or resolv\$3) same (resource near3 conflict\$3)) and 707/\$.ccls.	USPAT	2003/07/28 13:52
-	41	((resolution or resolv\$3) same (resource near3 conflict\$3)) and 711/\$.ccls.	USPAT	2003/07/28 13:54
-	8	((resolution or resolv\$3) same (resource near3 conflict\$3)) and 714/\$.ccls.	USPAT	2003/07/28 13:55
-	5	((resolution or resolv\$3) same (resource near3 conflict\$3)) and 717/\$.ccls.	USPAT	2003/07/28 13:55
-	1	"6161150".PN.	USPAT	2003/07/28 13:57
-	1	"6157840".PN.	USPAT	2003/07/28 13:58
-	1	"5806074".PN.	USPAT	2003/07/28 13:59
-	1	"5732351".PN.	USPAT	2003/07/28 14:00
-	1	"5574969".PN.	USPAT	2003/07/28 14:00
-	1	"6353836".PN.	USPAT	2003/07/28 14:47
-	1	"6279084".PN.	USPAT	2003/07/28 14:47

-	1	"6256712".PN.	USPAT	2003/07/28 14:48
-	1	"6256712".PN.	USPAT	2003/07/28 14:49
-	1	"6154811".PN.	USPAT	2003/07/28 14:49
-	1	"6151607".PN.	USPAT	2003/07/28 14:50
-	1	"6092157".PN.	USPAT	2003/07/28 14:50
-	1	"6085198".PN.	USPAT	2003/07/28 14:50
-	1	"6052758".PN.	USPAT	2003/07/28 15:29
-	1	"5987477".PN.	USPAT	2003/07/28 15:31
-	1	"5966706".PN.	USPAT	2003/07/28 15:32
-	1	"5924096".PN.	USPAT	2003/07/28 15:32
-	1	"5903910".PN.	USPAT	2003/07/28 15:34
-	1	"5832516".PN.	USPAT	2003/07/28 15:34
-	1	"5829032".PN.	USPAT	2003/07/28 15:34
-	1	"5680576".PN.	USPAT	2003/07/28 15:35
-	1	"5327556".PN.	USPAT	2003/07/28 15:35
-	1	"5327556".PN.	USPAT	2003/07/28 15:35
-	1	"5297269".PN.	USPAT	2003/07/28 15:35
-	1	"5625818".PN.	USPAT	2003/07/28 15:47
-	1	"5613079".PN.	USPAT	2003/07/28 15:48
-	1	"5434994".PN.	USPAT	2003/07/28 15:49
-	1	"5434994".PN.	USPAT	2003/07/28 15:49
-	1	"5386559".PN.	USPAT	2003/07/28 15:49
-	1	"5301316".PN.	USPAT	2003/07/28 15:50
-	1	"5295222".PN.	USPAT	2003/07/28 15:50
-	1	"5212788".PN.	USPAT	2003/07/28 15:50
-	224	(resolution or resolv\$3) same ((resource or IP) near3 conflict\$3)	USPAT	2003/07/28 16:06
-	3	(resolution or resolv\$3) same ((IP) near3 conflict\$3)	USPAT	2003/07/28 16:15
-	1	"6327662".PN.	USPAT	2003/07/28 16:08
-	1	"6304908".PN.	USPAT	2003/07/28 16:09
-	1	"6269099".PN.	USPAT	2003/07/28 16:09
-	1	"6266707".PN.	USPAT	2003/07/28 16:10
-	1	"6058431".PN.	USPAT	2003/07/28 16:15
-	162	(resolution or resolv\$3) same ((address) near3 conflict\$3)	USPAT	2003/07/29 13:38
-	12	((resolution or resolv\$3) same ((address) near3 conflict\$3)) and 709/\$.ccls.	USPAT	2003/07/28 16:20
-	76	(dhcp) and (conflict\$3)	USPAT	2003/07/28 16:26
-	13	(resource near4 conflict\$3) and (single near4 version)	USPAT	2003/07/28 16:48

-	32	(resolv\$3 same conflict\$3).ti.	USPAT	2003/07/28 19:02
-	1	"6457065".PN.	USPAT	2003/07/28 16:50
-	1	"6457065".PN.	USPAT	2003/07/28 17:14
-	1	"6393434".PN.	USPAT	2003/07/28 17:15
-	1	"6343299".PN.	USPAT	2003/07/28 17:15
-	1	"6182121".PN.	USPAT	2003/07/28 17:15
-	1	("6377540").PN.	USPAT; US-PGPUB	2003/07/28 19:02
-	162	(resolution or resolv\$3) same ((address) near3 conflict\$3)	USPAT	2003/07/29 13:38
-	0	((resolution or resolv\$3) same ((address) near3 conflict\$3)) and (put near3 method)	USPAT	2003/07/29 13:39
-	92	client and server and (put near3 method)	USPAT	2003/07/29 13:39
-	27	(client and server and (put near3 method)) and tag\$4	USPAT	2003/07/29 13:40
-	2	((("5884325") or ("5924096"))).PN.	USPAT; US-PGPUB	2004/02/17 13:52
-	10	((("5884325") or ("5924096") or ("6578069") or ("6256740") or ("6182117") or ("6049799") or ("5812793") or ("5812773") or ("5787262") or ("6578054"))).PN.	USPAT; US-PGPUB	2004/02/18 13:21
-	44	chat.xa.	USPAT; US-PGPUB	2004/02/18 13:24
-	0	(phuoc.nguyen).xa.	USPAT; US-PGPUB	2004/02/18 13:24
-	0	(phuoc and wiley).xa.	USPAT; US-PGPUB	2004/02/18 13:25
-	200	(phuoc).xa.	USPAT; US-PGPUB	2004/02/18 13:25
-	31	((phuoc).xa.) and wiley	USPAT; US-PGPUB	2004/02/18 13:25
-	0	(nguyen.phuoc).xa.	USPAT; US-PGPUB	2004/02/18 13:25
-	4	(dustin).xa.	USPAT; US-PGPUB	2004/02/18 13:29
-	2	((("5806074") or ("5924096"))).PN.	USPAT; US-PGPUB	2004/02/18 13:29

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Telecommunications Information Networking Architecture Conference Proceedings, 1999. TINA '99 , 12-15 April 1999

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4 Application-level isolation to cope with malicious database users

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5 A performance comparison of locking methods with limited wait depth

Thomasian, A.;

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6 Run-time adjusted congestion control for multimedia: experimental results

De Marco, G.; Longo, M.; Postiglione, F.;

Advanced Information Networking and Applications, 2004. AINA 2004. 18th International Conference on , Volume: 1 , 2004

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7 A QoS performance measure framework for distributed heterogeneous networks

Jong-Kook Kim; Hensgen, D.A.; Kidd, T.; Siegel, H.J.; St. John, D.; Irvine, C.; Levin, T.; Porter, N.W.; Prasanna, V.K.; Freund, R.F.;

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8 A dining philosophers algorithm with polynomial response time

Awerbuch, B.; Saks, M.;

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9 plan ERS-1: an expert planning system for generating spacecraft mission plans

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1 [Client-server computing in mobile environments](#)

Jin Jing, Abdelsalam Sumi Helal, Ahmed Elmagarmid

 June 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 2

Full text available: pdf(233.31 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Recent advances in wireless data networking and portable information appliances have engendered a new paradigm of computing, called mobile computing, in which users carrying portable devices have access to data and information services regardless of their physical location or movement behavior. In the meantime, research addressing information access in mobile environments has proliferated. In this survey, we provide a concrete framework and categorization of the various way ...

Keywords: application adaptation, cache invalidation, caching, client/server, data dissemination, disconnected operation, mobile applications, mobile client/server, mobile computing, mobile data, mobility awareness, survey, system application

2 [The Roma personal metadata service](#)

Edward Swierk, Emre Kiciman, Nathan C. Williams, Takashi Fukushima, Hideki Yoshida, Vince Laviano, Mary Baker

 October 2002 **Mobile Networks and Applications**, Volume 7 Issue 5

Full text available: pdf(221.38 KB)

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People now have available to them a diversity of digital storage facilities, including laptops, cell phone address books, handheld devices, desktop computers and web-based storage services. Unfortunately, as the number of personal data repositories increases, so does the management problem of ensuring that the most up-to-date version of any document in a user's personal file space is available to him on the storage facility he is currently using. We introduce the Roma personal metadata service t ...

Keywords: data synchronization, distributed data storage, distributed databases, metadata, mobile computing, personal systems

3 [The evolution of Coda](#)

M. Satyanarayanan

May 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 2

Full text available:  [pdf\(441.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Failure-resilient, scalable, and secure read-write access to shared information by mobile and static users over wireless and wired networks is a fundamental computing challenge. In this article, we describe how the Coda file system has evolved to meet this challenge through the development of mechanisms for server replication, disconnected operation, adaptive use of weak connectivity, isolation-only transactions, translucent caching, and opportunistic exploitation of hardware surrogates. For eac ...

Keywords: Adaptation, Linux, UNIX, Windows, caching, conflict resolution, continuous data access, data staging, disaster recovery, disconnected operation, failure, high availability, hoarding, intermittent networks, isolation-only transactions, low-bandwidth networks, mobile computing, optimistic replica control, server replication, translucent cache management, weakly connected operation

4 [Decentralized storage systems: Ivy: a read/write peer-to-peer file system](#)

Athicha Muthitacharoen, Robert Morris, Thomer M. Gil, Benjie Chen

December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI


Full text available:  [pdf\(1.65 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Ivy is a multi-user read/write peer-to-peer file system. Ivy has no centralized or dedicated components, and it provides useful integrity properties without requiring users to fully trust either the underlying peer-to-peer storage system or the other users of the file system. An Ivy file system consists solely of a set of logs, one log per participant. Ivy stores its logs in the DHash distributed hash table. Each participant finds data by consulting all logs, but performs modifications by appendi ...

5 [Rover: a toolkit for mobile information access](#)

A. D. Joseph, A. F. de Lespinasse, J. A. Tauber, D. K. Gifford, M. F. Kaashoek


December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5

Full text available:  [pdf\(2.18 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

6 [Distributed file systems: concepts and examples](#)

Eliezer Levy, Abraham Silberschatz

December 1990 **ACM Computing Surveys (CSUR)**, Volume 22 Issue 4

Full text available:  [pdf\(5.33 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


The purpose of a distributed file system (DFS) is to allow users of physically distributed computers to share data and storage resources by using a common file system. A typical configuration for a DFS is a collection of workstations and mainframes connected by a local area network (LAN). A DFS is implemented as part of the operating system of each of the connected computers. This paper establishes a viewpoint that emphasizes the dispersed structure and decentralization of both data and con ...

7 [Serverless network file systems](#)

Thomas E. Anderson, Michael D. Dahlin, Jeanna M. Neefe, David A. Patterson, Drew S. Roselli, Randolph Y. Wang

February 1996 **ACM Transactions on Computer Systems (TOCS)**, Volume 14 Issue 1

Full text available: Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

 [pdf\(2.69 MB\)](#)[terms](#)

We propose a new paradigm for network file system design: serverless network file systems. While traditional network file systems rely on a central server machine, a serverless system utilizes workstations cooperating as peers to provide all file system services. Any machine in the system can store, cache, or control any block of data. Our approach uses this location independence, in combination with fast local area networks, to provide better performance and scalability th ...

Keywords: RAID, log cleaning, log structured, log-based striping, logging, redundant data storage, scalable performance

8 [Consistency and replication: Decentralized weighted voting for P2P data management](#)

Maya Rodrig, Anthony LaMarca

September 2003 **Proceedings of the 3rd ACM international workshop on Data engineering for wireless and mobile access**

Full text available:  [pdf\(448.69 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


This paper presents a decentralized variant of David Gifford's classic weighted-voting scheme for managing replicated data. Weighted voting offers a familiar consistency model and supports on-line replica reconfiguration. These properties make it a good fit for applications in the pervasive computing domain. By distributing versioned metadata along with data replicas, and managing access to both data and metadata with the same quorums, our algorithm supports a peer-to-peer environment with dynam ...

Keywords: consistency, peer-to-peer data management, pervasive computing, quorums, weighted voting

9 [Managing update conflicts in Bayou, a weakly connected replicated storage system](#)

D. B. Terry, M. M. Theimer, Karin Petersen, A. J. Demers, M. J. Spreitzer, C. H. Hauser

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5


Full text available:  [pdf\(1.56 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

10 [Serverless network file systems](#)

T. E. Anderson, M. D. Dahlin, J. M. Neefe, D. A. Patterson, D. S. Roselli, R. Y. Wang

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5


Full text available:  [pdf\(2.48 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

11 [Chimera: hypertext for heterogeneous software environments](#)

Kenneth M. Anderson, Richard N. Taylor, E. James Whitehead

September 1994 **Proceedings of the 1994 ACM European conference on Hypermedia technology**

Full text available:  [pdf\(1.57 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Emerging software development environments are characterized by heterogeneity: they are composed of diverse object stores, user interfaces, and tools. This paper presents an approach for providing hypertext services in this heterogeneous setting. Central notions of the approach include the following. Anchors are established with respect to interactive views

of objects, rather than the objects themselves. Composable, n-ary links can be established between an ...

12 Using metalevel techniques in a flexible toolkit for CSCW applications

Paul Dourish

June 1998 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 5 Issue 2

Full text available:  pdf(292.97 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Ideally, software toolkits for collaborative applications should provide generic, reusable components, applicable in a wide range of circumstances, which software developers can assemble to produce new applications. However, the nature of CSCW applications and the mechanics of group interaction present a problem. Group interactions are significantly constrained by the structure of the underlying infrastructure, below the level at which toolkits typically offer control. This article describe ...

Keywords: consistency control, consistency guarantees, data distribution, divergency, metalevel programming, open implementation, software architecture

13 Weighted voting for replicated data

David K. Gifford

December 1979 **Proceedings of the seventh ACM symposium on Operating systems principles**

Full text available:  pdf(93.87 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


In a new algorithm for maintaining replicated data, every copy of a replicated file is assigned some number of votes. Every transaction collects a read quorum of rvotes to read a file, and a write quorum of wvotes to write a file, such that $r+w$ is greater than the total number of votes assigned to the file. This ensures that there is a non-null intersection between every read quorum and every write quorum. Version numbers m ...

Keywords: Computer network, File suite, File system, Locking, Quorum, Replicated data, Representative, Transaction, Weak representative, Weighted voting

14 Decentralized storage systems: Taming aggressive replication in the Pangaea wide-area file system

Yasushi Saito, Christos Karamanolis, Magnus Karlsson, Mallik Mahalingam

December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

Full text available:  pdf(1.93 MB)

Additional Information: [full citation](#), [abstract](#), [references](#)

Pangaea is a wide-area file system that supports data sharing among a community of widely distributed users. It is built on a symmetrically decentralized infrastructure that consists of commodity computers provided by the end users. Computers act autonomously to serve data to their local users. When possible, they exchange data with nearby peers to improve the system's overall performance, availability, and network economy. This approach is realized by aggressively creating a replica of a file w ...

15 The <bigwig> project

Claus Brabrand, Anders Møller, Michael I. Schwartzbach

May 2002 **ACM Transactions on Internet Technology (TOIT)**, Volume 2 Issue 2

Full text available:  pdf(586.33 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present the results of the <bigwig> project, which aims to design and implement a high-

level domain-specific language for programming interactive Web services.


A fundamental aspect of the development of the World Wide Web during the last decade is the gradual change from static to dynamic generation of Web pages. Generating Web pages dynamically in dialog with the client has the advantage of providing up-to-date and tailor-made information. The development of systems ...

Keywords: Interactive Web services, program analysis

16 XML transactions: Efficient synchronization for mobile XML data

Franky Lam, Nicole Lam, Raymond Wong

November 2002 **Proceedings of the eleventh international conference on Information and knowledge management**

Full text available:  pdf(116.31 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Many handheld applications receive data from a primary database server and operate in an intermittently connected environment these days. They maintain data consistency with data sources through synchronization. In certain applications such as sales force automation, it is highly desirable if updates on the data source can be reflected at the handheld applications immediately. This paper proposes an efficient method to synchronize XML data on multiple mobile devices. Each device retrieves and cac ...

Keywords: XML, information dissemination, information subscription, path containment

17 Cluster-based file replication in large-scale distributed systems

Harjinder S. Sandhu, Songnian Zhou

June 1992 **ACM SIGMETRICS Performance Evaluation Review , Proceedings of the 1992 ACM SIGMETRICS joint international conference on Measurement and modeling of computer systems**, Volume 20 Issue 1


Full text available:  pdf(1.31 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The increasing need for data sharing in large-scale distributed systems may place a heavy burden on critical resources such as file servers and networks. Our examination of the workload in one large commercial engineering environment shows that wide-spread sharing of unstable files among tens to hundreds of users is common. Traditional client-based file cacheing techniques are not scalable in such environments. We propose Frolic, a scheme for cluster-based file replication in lar ...

18 Adaptive, fine-grained sharing in a client-server OODBMS: a callback-based approach

Markos Zaharioudakis, Michael J. Carey, Michael J. Franklin

December 1997 **ACM Transactions on Database Systems (TODS)**, Volume 22 Issue 4

Full text available:  pdf(441.80 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


For reasons of simplicity and communication efficiency, a number of existing object-oriented database management systems are based on page server architectures; data pages are their minimum unit of transfer and client caching. Despite their efficiency, page servers are often criticized as being too retractive when it comes to concurrency, as existing systems use pages as the minimum locking unit as well. In this paper we show how to support object-level locking in a page-server context. Sev ...

Keywords: cache coherency, cache consistency, client-server databased, fine-grained sharing, object-oriented databases, performance analysis

19 Viewstamped replication: a general primary copy

Brian M. Oki, Barbara H. Liskov

January 1988 **Proceedings of the seventh annual ACM Symposium on Principles of distributed computing**


Full text available:  pdf (1.38 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



20 A memory-efficient real-time non-copying garbage collector

Tian F. Lim, Przemysław Pardyak, Brian N. Bershad

October 1998 **ACM SIGPLAN Notices , Proceedings of the first international symposium on Memory management**, Volume 34 Issue 3

Full text available:  pdf (1.58 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



Garbage collectors used in embedded systems such as Personal Java and Inferno or in operating systems such as SPIN must operate with limited resources and minimize their impact on application performance. Consequently, they must maintain short real-time pauses, low overhead, and a small memory footprint. Most garbage collectors, including the Treadmill algorithm, are inadequate because they sacrifice space for time. We have implemented a new Treadmill variant that provides good memory utilization ...

Keywords: garbage collection, operating systems, real-time, treadmill

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21 [An architecture for multi-user software development environments](#)

Israel Z. Ben-Shaul, Gail E. Kaiser, George T. Heineman

 November 1992 **ACM SIGSOFT Software Engineering Notes , Proceedings of the fifth ACM SIGSOFT symposium on Software development environments**, Volume 17 Issue 5

 Full text available: [pdf \(1.27 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present an architecture for multi-user software development environments, covering general, process-centered and rule-based MUSDEs. Our architecture is founded on componentization, with particular concern for the capability to replace the synchronization component—to allow experimentation with novel concurrency control mechanisms—with minimal effects on other components while still supporting integration. The architecture has been implemented for the MARVEL SDE.

22 [Query evaluation techniques for large databases](#)

Goetz Graefe

 June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2

 Full text available: [pdf \(9.37 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of parallelization, parallel algorithms, relational database systems, set-matching algorithms, sort-hash duality

23 [Garbage collection for a client-server persistent object store](#)

Laurent Amsaleg, Michael J. Franklin, Olivier Gruber

 August 1999 **ACM Transactions on Computer Systems (TOCS)**, Volume 17 Issue 3

Full text available:  pdf(267.18 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


We describe an efficient server-based algorithm for garbage collecting persistent object stores in a client-server environment. The algorithm is incremental and runs concurrently with client transactions. Unlike previous algorithms, it does not hold any transactional locks on data and does not require callbacks to clients. It is fault-tolerant, but performs very little logging. The algorithm has been designed to be integrated into existing systems, and therefore it works with standard i ...

Keywords: client-server system, logging, persistent object-store, recovery

24 [Object orientation in multidatabase systems](#)

Evaggelia Pitoura, Omran Bukhres, Ahmed Elmagarmid

June 1995 **ACM Computing Surveys (CSUR)**, Volume 27 Issue 2

Full text available:  pdf(4.85 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


A multidatabase system (MDBS) is a confederation of preexisting distributed, heterogeneous, and autonomous database systems. There has been a recent proliferation of research suggesting the application of object-oriented techniques to facilitate the complex task of designing and implementing MDBSs. Although this approach seems promising, the lack of a general framework impedes any further development. The goal of this paper is to provide a concrete analysis and categorization of the various ...

Keywords: distributed objects, federated databases, integration, multidatabases, views

25 [Reception and posters: Location-aware data broadcasting: an application for digital mobile broadcasting in Japan](#)

Kinji Matsumura, Kazuya Usui, Kenjiro Kai, Koichi Ishikawa

November 2003 **Proceedings of the eleventh ACM international conference on Multimedia**

Full text available:  pdf(1.19 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Terrestrial digital broadcasting that uses the ISDB-T (Integrated Services Digital Broadcasting-Terrestrial) system is scheduled for launch in Japan in December 2003. This system also enables mobile broadcasting service, which will be offered a few years later. We are developing a Location-Aware Data Broadcasting Service as a remarkably new type of interactive mobile broadcasting service. In this paper, we describe the service application, information filtering method, and presentation technique ...

Keywords: BML, GPS, ISDB, data broadcasting, location-aware, mobile reception, terrestrial digital broadcasting

26 [The range scheduling aid](#)

Barry D. Smith, Joseph Katz


June 1990 **Proceedings of the third international conference on Industrial and engineering applications of artificial intelligence and expert systems - Volume 1**

Full text available:  pdf(1.27 MB) Additional Information: [full citation](#), [references](#), [index terms](#)

27 [File servers for network-based distributed systems](#)

Liba Svobodova


December 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 4

Full text available:  pdf(4.23 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

28 Concurrency control in advanced database applications

Naser S. Barghouti, Gail E. Kaiser

September 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 3

Full text available:  pdf(4.69 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: advanced database applications, concurrency control, cooperative transactions, design environments, extended transaction models, long transactions, object-oriented databases, relaxing serializability

29 Designing and implementing asynchronous collaborative applications with Bayou

W. Keith Edwards, Elizabeth D. Mynatt, Karin Petersen, Mike J. Spreitzer, Douglas B. Terry, Marvin M. Theimer

October 1997 **Proceedings of the 10th annual ACM symposium on User interface software and technology**


Full text available:  pdf(1.58 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Bayou, asynchronous interaction, computer-supported cooperative work, distributed systems

30 A time-sensitive object model for real-time systems

H. Rebecca Callison

July 1995 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 4 Issue 3


Full text available:  pdf(2.16 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Process-oriented models for real-time systems focus on the timing constraints of processes, a focus that can adversely affect resulting designs. Data dependencies between processes create scheduling interactions that limit the times at which processes may execute. Processes are then designed to fit available windows in the overall system schedule. "Fitting in" frequently involves fragmenting processes to fit scheduling windows and/or designing program and data s ...

Keywords: concurrency, fault tolerance, object models, programming techniques, real-time processing models, timing constraints

31 Two case studies of open source software development: Apache and Mozilla

July 2002 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 11 Issue 3

Full text available:  pdf(373.10 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

According to its proponents, open source style software development has the capacity to compete successfully, and perhaps in many cases displace, traditional commercial development methods. In order to begin investigating such claims, we examine data from


two major open source projects, the Apache web server and the Mozilla browser. By using email archives of source code change history and problem reports we quantify aspects of developer participation, core team size, code ownership, productivity ...

Keywords: Apache, Mozilla, Open source software, code ownership, defect density, repair interval

32 An object-oriented, distributed architecture for large-scale Ada systems

Phillipe Kruchten, Christopher J. Thompson

November 1994 **Proceedings of the conference on TRI-Ada '94**

Full text available:  pdf(1.14 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an architectural model ideally suited for the description of large, distributed command and control systems. This model is organized around multiple dimensions (or views) of software architecture and is used to describe the software architecture of a family of automated air traffic control systems currently under development by Hughes Aircraft of Canada. Some of the features of this family of systems are described, and in particular the mechanism used for transparent acc ...

33 Papers: On the move: Join and capture: a model for nomadic interaction

Dan R. Olsen, S. Travis Nielsen, David Parslow

November 2001 **Proceedings of the 14th annual ACM symposium on User interface software and technology**

Full text available:  pdf(988.82 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The XWeb architecture delivers interfaces to a wide variety of interactive platforms. XWeb's SUBSCRIBE mechanism allows multiple interactive clients to synchronize with each other. We define the concept of Join as the mechanism for acquiring access to a service's interface. Join also allows the formation of spontaneous collaborations with other people. We define the concept of Capture as the means for users to assemble suites of interactive resources to apply to a particular problem. These mecha ...

Keywords: Multimodal interaction, mobile, nomadic, ubiquitous

34 DistEdit: a distributed toolkit for supporting multiple group editors

Michael J. Knister, Atul Prakash

September 1990 **Proceedings of the 1990 ACM conference on Computer-supported cooperative work**

Full text available:  pdf(1.07 MB)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The purpose of our project is to provide toolkits for building applications that support collaboration between people in distributed environments. In this paper, we describe one such toolkit, called DistEdit, that can be used to build interactive group editors for distributed environments. This toolkit has the ability to support different editors simultaneously and provides a high degree of fault-tolerance against machine crashes. To evaluate the toolkit, we modified two editors to make use ...

35 Embedded video in hypermedia documents: supporting integration and adaptive control

Dick C. A. Bulterman

October 1995 **ACM Transactions on Information Systems (TOIS)**, Volume 13 Issue 4


Full text available:  pdf(2.41 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As the availability of digital video becomes commonplace, a shift in application focus will occur from merely accessing video as an independent data stream to embedding video with other multimedia data types into coordinated hypermedia presentations. The migration to embedded video will present new demands on application and support environments: processing of any one piece of video data will depend on how that data relates to other data streams active with ...

Keywords: adaptive control, embedded video, hypermedia documents, multimedia, synchronization, video presentation

36 [Highly concurrent cache consistency for indices in client-server database systems](#)


Markos Zaharioudakis, Michael J. Carey

June 1997 **ACM SIGMOD Record , Proceedings of the 1997 ACM SIGMOD international conference on Management of data**, Volume 26 Issue 2Full text available:  pdf(1.81 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we present four approaches to providing highly concurrent B+-tree indices in the context of a data-shipping, client-server OODBMS architecture. The first performs all index operations at the server, while the other approaches support varying degrees of client caching and usage of index pages. We have implemented the four approaches, as well as the 2PL approach, in the context of the SHORE OODB system at Wisconsin, and we present experimen ...

37 [Mobile Computing: Scaling replica maintenance in intermittently synchronized mobile databases](#)

Wai Gen Yee, Michael J. Donahoo, Edward Omiecinski, Shamkant B. Navathe

October 2001 **Proceedings of the tenth international conference on Information and knowledge management**Full text available:  pdf(2.20 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

To avoid the high cost of continuous connectivity, a class of mobile applications employs replicas of shared data that are periodically updated. Updates to these replicas are typically performed on a client-by-client basis--that is, the server individually computes and transmits updates to each client--limiting scalability. By basing updates on replica groups (instead of clients), however, update generation complexity is no longer bound by client population size. Clients then download updates of ...

Keywords: distributed databases, intermittent synchronization, mobile databases

38 [Transactional client-server cache consistency: alternatives and performance](#)


Michael J. Franklin, Michael J. Carey, Miron Livny

September 1997 **ACM Transactions on Database Systems (TODS)**, Volume 22 Issue 3Full text available:  pdf(452.41 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Client-server database systems based on a data shipping model can exploit client memory resources by caching copies of data items across transaction boundaries. Caching reduces the need to obtain data from servers or other sites on the network. In order to ensure that such caching does not result in the violation of transaction semantics, a transactional cache consistency maintenance algorithm is required. Many such algorithms have been proposed in the literature and, as all provide the sam ...

39 Application performance on the Direct Access File System

Alexandra Fedorova, Margo Seltzer, Kostas Magoutis, Salimah Addetia


January 2004 **ACM SIGSOFT Software Engineering Notes , Proceedings of the fourth international workshop on Software and performance**, Volume 29 Issue 1Full text available:  pdf(1.01 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The Direct Access File System (DAFS) is a distributed file system built on top of direct-access transports (DAT). Direct-access transports are characterized by using remote direct memory access (RDMA) for data transfer and user-level networking. The motivation behind the DAT-enabled distributed file system architecture is the reduction of the CPU overhead on the I/O data path. We have created an implementation of DAFS for the FreeBSD platform. In this paper we describe the performance evaluation ...

Keywords: Direct Access File System, Distributed File Systems, RDMA, performance measurement

**40** Distributed object-based programming systems

Roger S. Chin, Samuel T. Chanson

March 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 1Full text available:  pdf(2.97 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The development of distributed operating systems and object-based programming languages makes possible an environment in which programs consisting of a set of interacting modules, or objects, may execute concurrently on a collection of loosely coupled processors. An object-based programming language encourages a methodology for designing and creating a program as a set of autonomous components, whereas a distributed operating system permits a collection of workstations or personal computers ...

Keywords: capability scheme, distributed operating systems, error recovery, method invocation, nested transaction, object model, object reliability, object-based programming languages, processor allocation, resource management, synchronization, transaction



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41 [ARIES/CSA: a method for database recovery in client-server architectures](#)

C. Mohan, Inderpal Narang

 May 1994 **ACM SIGMOD Record , Proceedings of the 1994 ACM SIGMOD international conference on Management of data**, Volume 23 Issue 2

 Full text available: [pdf\(1.33 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an algorithm, called ARIES/CSA (Algorithm for Recovery and Isolation Exploiting Semantics for Client-Server Architectures), for performing recovery correctly in client-server (CS) architectures. In CS, the server manages the disk version of the database. The clients, after obtaining database pages from the server, cache them in their buffer pools. Clients perform their updates on the cached pages and produce log records. The log records are buffered loca ...

42 [Applying randomized edge coloring algorithms to distributed communication: an experimental study](#)

Dannie Durand, Ravi Jain, David Tseytlin

 July 1995 **Proceedings of the seventh annual ACM symposium on Parallel algorithms and architectures**

 Full text available: [pdf\(1.10 MB\)](#)

 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

43 [Consistency and replication: Application specific data replication for edge services](#)

Lei Gao, Mike Dahlin, Amol Nayate, Jiandan Zheng, Arun Iyengar

 May 2003 **Proceedings of the twelfth international conference on World Wide Web**

 Full text available: [pdf\(476.22 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The emerging edge services architecture promises to improve the availability and performance of web services by replicating servers at geographically distributed sites. A key challenge in such systems is data replication and consistency so that edge server code can manipulate shared data without incurring the availability and performance penalties that would be incurred by accessing a traditional centralized database. This paper explores using a distributed object architecture to build an edge s ...

Keywords: availability, data replication, distributed objects, edge services, performance, wide area networks (WAN)

44 Using a coordination language to specify and analyze systems containing mobile components

P. Ciancarini, F. Franzé, C. Mascolo

April 2000 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 9 Issue 2Full text available:  pdf(306.92 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

New computing paradigms for network-aware applications need specification languages able to deal with the features of mobile code-based systems. A coordination language provides a formal framework in which the interaction of active entities can be expressed. A coordination language deals with the creation and destruction of code or complex agents, their communication activities, as well as their distribution and mobility in space. We show how the coordination language PoliS offers a flexible ...

45 A programming model for active documents

Paul Dourish, W. Keith Edwards, Jon Howell, Anthony LaMarca, John Lamping, Karin Petersen, Michael Salisbury, Doug Terry, Jim Thornton

November 2000 **Proceedings of the 13th annual ACM symposium on User interface software and technology**Full text available:  pdf(115.49 KB)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: active properties, component software, customization, document management

46 A case study of open source software development: the Apache server

Audris Mockus, Roy T. Fielding, James Herbsleb


June 2000 **Proceedings of the 22nd international conference on Software engineering**Full text available:  pdf(235.75 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

According to its proponents, open source style software development has the capacity to compete successfully, and perhaps in many cases displace, traditional commercial development methods. In order to begin investigating such claims, we examine the development process of a major open source application, the Apache web server. By using email archives of source code change history and problem reports we quantify aspects of developer participation, core team size, code ownership, productivity ...

Keywords: code ownership, defect density, open source, repair interval, software process

47 A survey of current object-oriented databases

Mansour Zand, Val Collins, Dale Caviness

February 1995 **ACM SIGMIS Database**, Volume 26 Issue 1Full text available:  pdf(1.44 MB)Additional Information: [full citation](#), [abstract](#), [index terms](#)

Object-oriented concepts form a good basis for the data models required for next-generation database applications such as CAD/CAE/CASE/CAM systems, knowledge-based systems, multimedia, etc. Many object-oriented databases are available commercially or are being developed by industry or academic research facilities. This paper attempts to compare some of these products using fourteen criteria. The selected criteria are major factors required for the successful design of an object-oriented database ...

Keywords: OOD-BMS survey, object-oriented database, object-oriented terminology

48 Versioning and fragmentation: Managing versions of web documents in a transaction-time web server

Curtis E. Dyreson, Hui-ling Lin, Yingxia Wang

May 2004 **Proceedings of the 13th international conference on World Wide Web**

Full text available:  pdf(238.32 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a transaction-time HTTP server, called TTAapache that supports document versioning. A document often consists of a main file formatted in HTML or XML and several included files such as images and stylesheets. A change to any of the files associated with a document creates a new version of that document. To construct a document version history, snapshots of the document's files are obtained over time. Transaction times are associated with each file version to record the version ...

Keywords: observant system, transaction time, versioning

49 Mostly-copying reachability-based orthogonal persistence

Antony L. Hosking, Jiawan Chen

October 1999 **ACM SIGPLAN Notices , Proceedings of the 14th ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications**, Volume 34 Issue 10

Full text available:  pdf(3.25 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We describe how reachability-based orthogonal persistence can be supported even in uncooperative implementations of languages such as C++ and Modula-3, and without modification to the compiler. Our scheme extends Bartlett's mostly-copying garbage collector to manage both transient objects and resident persistent objects, and to compute the reachability closure necessary for stabilization of the persistent heap. It has been implemented in our prototype of reachability-based persistence for M ...

50 Constraints for the web

Alan Borning, Richard Lin, Kim Marriott


November 1997 **Proceedings of the fifth ACM international conference on Multimedia**

Full text available:  pdf(1.65 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

51 A coherent distributed file cache with directory write-behind

Timothy Mann, Andrew Birrell, Andy Hisgen, Charles Jerian, Garret Swart

May 1994 **ACM Transactions on Computer Systems (TOCS)**, Volume 12 Issue 2


Full text available:  pdf(3.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Extensive caching is a key feature of the Echo distributed file system. Echo client machines maintain coherent caches of file and directory data and properties, with write-behind (delayed write-back) of all cached information. Echo specifies ordering constraints on this write-behind, enabling applications to store and maintain consistent data structures in the file system even when crashes or network faults prevent some writes from being completed. In this paper we describe ...

Keywords: coherence, file caching, write-behind

52 A structural view of the Cedar programming environment

Daniel C. Swinehart, Polle T. Zellweger, Richard J. Beach, Robert B. Hagmann

August 1986 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,
Volume 8 Issue 4Full text available:  pdf(6.32 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


This paper presents an overview of the Cedar programming environment, focusing on its overall structure—that is, the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. Its primary purpose is to increase the productivity of programmers whose activities include experimental programming and the development of prototype software systems for a high-performance personal computer. T ...

53 The IBM data warehouse architecture

Charles Bontempo, George Zagelow

September 1998 **Communications of the ACM**, Volume 41 Issue 9Full text available:  pdf(517.29 KB)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)**54** High-speed switch scheduling for local-area networks

Thomas E. Anderson, Susan S. Owicki, James B. Saxe, Charles P. Thacker


November 1993 **ACM Transactions on Computer Systems (TOCS)**, Volume 11 Issue 4Full text available:  pdf(2.37 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Current technology trends make it possible to build communication networks that can support high-performance distributed computing. This paper describes issues in the design of a prototype switch for an arbitrary topology point-to-point network with link speeds of up to 1 Gbit/s. The switch deals in fixed-length ATM-style cells, which it can process at a rate of 37 million cells per second. It provides high bandwidth and low latency for datagram traffic. In addition, it supports real-time t ...

Keywords: ATM networks, iterative matching, statistical matching, switching scheduling

55 Mobile data management: Middleware support for reconciling client updates and data transcoding

Thomas Phan, George Zorpas, Rajive Bagrodia

June 2004 **Proceedings of the 2nd international conference on Mobile systems, applications, and services**Full text available:  pdf(4.60 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


In mobile Internet applications, data can be transcoded, updated, and transferred across heterogenous clients. The problem then arises where updates made in the context of an initial transcoding results in content too stringently transcribed for subsequent clients, thereby causing loss of semantic value. We solve this problem by suggesting that the updates themselves can be transformed so that they can be applied directly to the original data instead of to the transcribed data; this approach allow ...

Keywords: client updates, data management, middleware, mobile computing, reconciliation, transcoding

56 The Zebra striped network file system

John H. Hartman, John K. Ousterhout

August 1995 **ACM Transactions on Computer Systems (TOCS)**, Volume 13 Issue 3

Full text available:  pdf(2.76 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


Zebra is a network file system that increases throughput by striping the file data across multiple servers. Rather than striping each file separately, Zebra forms all the new data from each client into a single stream, which it then stripes using an approach similar to a log-structured file system. This provides high performance for writes of small files as well as for reads and writes of large files. Zebra also writes parity information in each stripe in the style of RAID disk arrays; this ...

Keywords: RAID, log-based striping, log-structured file system, parity computation

57 [Distributed operating systems](#)

Andrew S. Tanenbaum, Robbert Van Renesse

December 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 4

Full text available:  pdf(5.49 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Distributed operating systems have many aspects in common with centralized ones, but they also differ in certain ways. This paper is intended as an introduction to distributed operating systems, and especially to current university research about them. After a discussion of what constitutes a distributed operating system and how it is distinguished from a computer network, various key design issues are discussed. Then several examples of current research projects are examined in some detail ...

58 [The Felix File Server](#)

M. Fridrich, W. Older

December 1981 **Proceedings of the eighth ACM symposium on Operating systems principles**

Full text available:  pdf(600.39 KB)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes Felix - a File Server for an experimental distributed multicomputer system. Felix is designed to support a variety of file systems, virtual memory, and database applications with access being provided by a local area network. Its interface combines block oriented data access with a high degree of crash resistance and a comprehensive set of primitives for controlling data sharing and consistency. An extended set of access modes allows increased concurrency over conventio ...

59 [A model of file server performance for a heterogeneous distributed system](#)

K K Ramakrishnan

August 1986 **ACM SIGCOMM Computer Communication Review , Proceedings of the ACM SIGCOMM conference on Communications architectures & protocols**, Volume 16 Issue 3

Full text available:  pdf(1.06 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


In this paper, we study the performance characteristics of a client-server style distributed system by a queueing network model. The system being modeled was based on an experimental distributed system currently being prototyped. As a specific detailed case study, we have evaluated the performance of a file server. A file server is a key component to achieve the data sharing necessary in a distributed system. The file server is probably the most heavily used resource of the distributed syst ...

60

[The Zebra striped network file system](#)

John H. Hartman, John K. Ousterhout

December 1993 **ACM SIGOPS Operating Systems Review , Proceedings of the
fourteenth ACM symposium on Operating systems principles**, Volume 27
Issue 5

Full text available:  [pdf \(1.93 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index
terms](#)

Zebra is a network file system that increases throughput by striping file data across multiple servers. Rather than striping each file separately, Zebra forms all the new data from each client into a single stream, which it then stripes using an approach similar to a log-structured file system. This provides high performance for writes of small files as well as for reads and writes of large files. Zebra also writes parity information in each stripe in the style of RAID disk arrays; this increase ...

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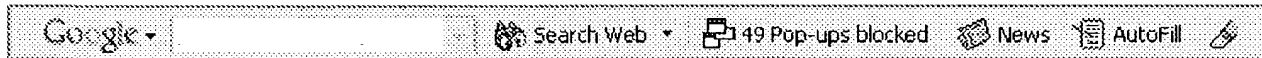
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